Diagnostic Engineering Publication

1410/7010

December 1, 1963

Subject: Diagnostic Program WT01B 1415 I/O Printer Test

Sequence Number 551
Replaces WT01A

When WT01 is in card form card # 001 is a System Control Card. It does not have any control information punched in it when it is released.

Refer to "1410/7010 Introduction", Volume 1.00 for instructions on how it must be punched.

This is a modified and improved version of WT01A. The modifications include:

A. Changes necessary to be compatible with the current diagnostic format.

B. Removal of the test routine called "WMS AND BLANKS IN M & L MODES."

C. Alteration and expansion of the test routine called "WM ALIGNMENT AND WM PERIOD TESTS."

D. Inclusion of a new test routine to check on band width (detenting difference) and alignment.

E. Changing the timing section to type out the time it took to type each line instead of each pair of lines. The timing routine (now) covers 7010 as well as 1410 systems.

F. Changing the method in which the optional "SELECTED CHARACTER ROUTINE" (build your own test pattern routine) operates.

Enclosures: 26 Pages
Card Deck for CARD ONLY SYSTEMS (as punched by UP51)
  8   Cards - Card Loader (1-7) and 1 Core Clear
 62   Cards No. 001-062 Data Cards
  1   Card   Execute Card

Distribution: X 1410
               X 7010
                  Other

WT01

1415 CONSOLE I/O PRINTER TEST

(1410/7010)

December 1, 1963

CONTENTS OF WT01 WRITE-UP AND LISTING

5.00.00.0 TEST DESCRIPTION

00.1 MODIFICATIONS

This is a modified and improved version of WT01A. The modifications include:

A.   Changes necessary to be compatible with the current diagnostic format. (Standard TADs at location 01000 and a Standard System Control Card to provide necessary system information and eliminate unnecessary operator intervention.)

B.   Removal of the test routine called "WMS AND BLANKS IN M & L MODES." This test routine contributed little to the overall effectiveness of the test.

C.   Alteration and expansion of the test routine called "WM ALIGNMENT AND WM PERIOD TESTS." See description, Section 5.00.00.2, for further information.

D.   Inclusion of a new test routine to check on band width (detenting difference) and alignment.

E.   Changing the timing section to type out the time it took to type each line instead of each pair of lines. The timing routine (now) covers 7010 as well as 1410 systems.

F.   Changing the method in which the optional "SELECTED CHARACTER ROUTINE" (build your own test pattern routine) operates. See OPERATING PROCEDURES, Section 5.00.02.2.

00.2 DESCRIPTION

WT01 is a functional test of the Program Printout Operations of the 1415 Console I/O Printer on the 1410 or 7010 Data Processing System. Test routines are directed toward checking Character Printout, Space, Word-Mark Control, and Carriage Return and Indexing Operations. The Input Operation is tested through the use of the Console Inquiry function.

5. 00. 00. 0   TEST DESCRIPTION (continued)

Test patterns are designed to test specific operations or phases of operations. Before each pattern is typed, the title of the test pattern selection character is typed (see Section 5. 00. 02. 2 for use of test pattern selection character).

The test patterns, their titles and test objectives are explained in the order in which they are run. Each test line of characters is typed twice for (visual) comparison.

COLLATING SEQUENCE   A

Type all characters in the COLLATING SEQUENCE for convenient visual checking.

ROCK   B

Test the tilt mechanism by typing the characters located one after the other in vertical columns on the print head.

ROLL   C

Test the rotate mechanism by selecting characters one after the other in horizontal bands around the print head.

TWIST   D

Test the combined rotate and tilt mechanism by causing a maximum rotation and tilt between characters.

WM ALLIGNMENT AND WM PERIOD TESTS   E

Exercise thoroughly spacing and backspacing mechanisms by typing word marks over every other character and then over every character. The word-mark period latch is given specific attention here.

BANDWIDTH & ALIGNMENT TEST   F

The characters typed are chosen specifically to test band width (detenting difference), alignment and the action of the wear compensator. The characters, $!QNLJ, are chosen because of their rotate selections. If a band width exists, it will be greatest among these characters. They are also used in a final check during alignment (fine tuning). The "J" is used extensively to cause the wear compensator to take up slack in the rotate and select system.

5. 00. 00. 0   <u>TEST DESCRIPTION</u>   (continued)

All test pattern selection characters should line up in position 42 on the margin scale as a test of the spacing operation. [1]

Carriage return is always tested in two ways, by margin lever stop and again by a group mark word mark at the end of the write field. All fixed test patterns are 83 characters long. Because of the printout identification character (R normally) and the space that follows it, the first test pattern character is typed in position three and the last in position eighty-five if the tabs are set correctly. A carriage return and indexing operation is therefore initiated by both the B channel group mark word mark and an end of line condition. This produces a double space between each pair of lines of every test pattern. Look for this to occur.

00. 3   EQUIPMENT

Any model 1410 or 7010 Data Processing System. The 1415 Console I/O Printer is the only I/O device tested. It is assumed to be on E channel only.

The Processing Overlap Feature is not necessary but is done in overlap mode if it is available.

00. 4   CARD DECK

A complete card deck of WT01 consists of the following:

7 cards	Loader
1 card	Execute (Core Clear)
program cards [2]	Program WT01
1 card	Execute (branch to 02000)

Note: Card No. 001 is a System Control Card. It <u>does not</u> have any control information punched in it when it is released. See "1410/7010 Introduction," Volume 1. 00, for instructions on how to punch it.

00. 5   EC LEVEL OF MACHINE

Not applicable.

[1.] Be sure to follow instructions on setting up margin lever stops as explained in OPERATING PROCEDURES, Section 5. 00. 02. 1.

[2.] See Release sheet for exact number of cards.

5. 00. 01. 0   LOADING PROCEDURES

Use Standard Diagnostic Loading Procedure. Refer to "1410/
7010 Introduction," Volume 1.00, for further information.

5. 00. 02. 0   OPERATING PROCEDURES

02. 1   Always set the right and left hand margin lever stops to their
maximum right and left hand positions (0 and 85, respectively).
The test patterns and the character position count both depend
on this. A group of four-digit numbers separated by slashes
occurs in one line of this test for counting purposes. The units
position of each number corresponds to the position of the
character with respect to the left-hand margin. The printout
identification character R is counted as number one.

WT01 begins immediately on completion of loading and no
manual intervention is required.

02. 2   Test operation can be altered at any time by using the "Program
Alter Routine." An Inquiry Request is acknowledged upon
completion of any line of type. TADs are loaded as blanks
and the locations are only tested for 1. TAD5, a Special TAD,
is an exception and its use is described fully.

Standard TADs

TADs	Address	Not 1	1
TAD0	01000	Do Not	Bypass Typeouts
TAD1	01001	Do Not	Loop on Routine
TAD2	01002	Do Not	Halt on Error
TAD3	01003	Do Not	Repeat Test

Special TADs

| TAD4 | 01004 | Do Not | Typeout time to type 1 line |
| TAD5 | 01005 | Do Not | Select Test Pattern by letter |

TAD 0 is used only to bypass an error message typeout.

Setting TAD 4 to a 1 causes a typeout of the time it took to
type the line preceding it to be given. Use only on systems
with the Processing Overlap Feature.

5.00.02.0 OPERATING PROCEDURES (continued)

Use TAD 5 to select a particular test pattern by name
(actually by letter). If it remains a blank, all test routines
are run in order. Entering the test pattern selection char-
acter (A, B, C, ...F) causes the test to go directly to the
pattern selected. The test patterns and the letters that
relate to them are covered in the description, Section
5.00.00.1. Entering an X causes the test to go to the
"SELECTED CHARACTER ROUTINE." After entering an
M or an L in response to "ENTER MODE- M OR L," the
request "ENTER DATA FIELD" is made. At this time a
full line of characters with or without word marks may be
entered. If the number of characters entered is less than
a full line (83), the portion entered is expanded to produce
a full line typeout. To have less than a full line typed out,
enter a group mark word mark after the last character to
be typed. The line of characters is typed twice unless TAD1
is set to loop on routine. Entering a Z in TAD 5 takes the
program to the end of job message and into the next test.

5.00.03.0 OPERATING HINTS, COMMENTS

03.1 On systems equipped with overlap all test routines are typed
in overlap mode. This makes it convenient to give typeouts
of the length of time it takes to type a given line on request.
If it is necessary to operate in unoverlap mode, reload
the test, press STOP while "WT01" is being typed out,
alter location 01263 to a blank, RESET and START. The
test is started over from the beginning including the
necessary initialization.

Should it ever be necessary to time (approximately) a car-
riage return operation instead of a normal line print
operation, the following is offered.[1] Use the SELECTED
CHARACTER ROUTINE to type a simple line, preferably
blanks (b's) in Load Mode or zeros (0's). Set TAD 1 to loop
on routine (location 01001 to a 1) and TAD 4 to a 1 for timing.
With the right hand margin selector on 85 (end of line), take
several lines of outputs. Now set the margin selector to
84. This causes a carriage return and the last character
of the line to be typed in column 1. The time difference
between the two lines is carriage return time (approximately).

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[1] Timing can only be used on systems with the Processing Overlap
Feature.

5. 00. 03. 0   OPERATING HINTS, COMMENTS

03.2   The time for one pass of WT01 including all test routines, titles, etc., but no timing typeouts or Inquiry Requests is approximately 4 minutes.

03.3   The SELECTED CHARACTER ROUTINE can be used to investigate the Output Error Routine by entering a group mark word mark for the data field. This causes an under-scored zero ($\underline{0}$) followed by underscored blanks ($\underline{b}$) to be typed. All characters are typed in column 1. Once this operation is initiated, it is not under program control and STOP or RESET must be used to terminate it.

5. 00. 04. 0   PROGRAM STOPS, RESTARTS

There are no Normal Stops in WT01 and only one Error Stop. It is under TAD control and occurs only if TAD 2 is set to 1. The STOP follows an error typeout indicating a data check error.   Push START to continue the test.

RESET and START causes the test to begin again at 02000, repeating the typeout of the test identification and per-forming all the initialization.

5. 00. 05. 0   TYPEOUTS

05.1   The only typeout that has not been explained in preceding sections or may need clarification is:

*** DATA CHECK IN LAST LINE TYPED ***

This message indicates that a parity check error (Data Check) occurred during the typing of the test line above it. The character or characters involved should be underscored.

5. 00. 02. 0   OPERATING PROCEDURES (continued)

Use TAD 5 to select a particular test pattern by name
(actually by letter). If it remains a blank, all test routines
are run in order.   Entering the test pattern selection char-
acter (A, B, C, ... F) causes the test to go directly to the
pattern selected. The test patterns and the letters that
relate to them are covered in the description, Section
5. 00. 00. 1. Entering an X causes the test to go to the
"SELECTED CHARACTER ROUTINE." After entering an
M or an L in response to "ENTER MODE- M OR L, " the
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a full line typeout. To have less than a full line typed out,
enter a group mark word mark after the last character to
be typed. The line of characters is typed twice unless TAD1
is set to loop on routine. Entering a Z in TAD 5 takes the
program to the end of job message and into the next test.

5. 00. 03. 0   OPERATING HINTS, COMMENTS

03. 1   On systems equipped with overlap all test routines are typed
in overlap mode. This makes it convenient to give typeouts
of the length of time it takes to type a given line on request.
If for some reason it is necessary to operate in unoverlap
mode once the test is in progress, alter location 01263 to a
blank (location denotes overlap in System Control Card),
RESET and START. The test is started over from the
beginning including the necessary initialization.

Should it ever be necessary to time (approximately) a car-
riage return operation instead of a normal line print
operation, the following is offered.[1] Use the SELECTED
CHARACTER ROUTINE to type a simple line, preferably
blanks (b's) in Load Mode or zeros (0's). Set TAD 1 to loop
on routine (location 01001 to a 1) and TAD 4 to a 1 for timing.
With the right hand margin selector on 85 (end of line), take
several lines of outputs. Now set the margin selector to
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[1]   Timing can only be used on systems with the Processing Overlap
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APPENDIX

1415 CONSOLE PRINTER

TRANSLATOR, OUTPUT

BCD Bits	Magnet Picked
$\bar{2}$	R1
$\bar{8} \cdot 4$	R2
$\bar{8} + 4$	R2A
$8 \cdot \bar{1} + \bar{8} \cdot 1$	R5
$\bar{A}$	T1
$\bar{B}$	T2
$\bar{C}$	CK
$\overline{8 \cdot 4 \cdot 2 \cdot 1} + 8 \cdot 4$	UC
All others	LC
$^\vee$ (Word Mark)	UC· CK
_ (Underscore)	UC· CK· T1· T2

TRANSLATOR, INPUT

Contacts Transferred	BCD Bit
R5· $\overline{R2A}$· LC + $\overline{R5}$· R2A + $\overline{R5}$· UC	1
R1· $\overline{R2A}$· + LC· R1	2
R2· $\overline{R2A}$	4
R2A· LC + $\overline{R2A}$· UC	8
T1	A
T2	B
CK + Space	C
Word Mark	WM

Contracts transfer when corresponding magnet is NOT picked, **except** R5 which transfers when magnet is picked.

Keyboard to contact coding is same as magnets picked.

1415 CONSOLE PRINTER

Character	C	B	A	8	4	2	1	R1	R2	R2A	R5	T1	T2	C	UC	LC	*
b (Blank)	C							R1	R2	R2A		T1	T2		UC		*
. (Period		B	A	8		2	1							C		LC	
¤)	C	B	A	8	4			R1		R2A	R5				UC		
[		B	A	8	4		1	R1		R2A				C	UC		
<		B	A	8	4	2				R2A	R5			C	UC		
≢ (Group Mark)	C	B	A	8	4	2	1			R2A					UC		
& (Ampersand) +	C	B	A					R1	R2	R2A					UC		*
$	C	B		8		2	1					T1				LC	
*		B		8	4			R1		R2A	R5	T1		C	UC		
]	C	B		8	4		1	R1		R2A		T1			UC		
;	C	B		8	4	2				R2A	R5	T1			UC		
△		B		8	4	2	1			R2A		T1		C	UC		
-		B						R1	R2	R2A		T1		C	UC		*
/	C		A				1	R1	R2	R2A	R5		T2			LC	*
, (Comma)	C		A	8		2	1						T2			LC	
% ( ) (			A	8	4			R1		R2A	R5		T2	C	UC		
⌐ (Wd Separator)	C		A	8	4		1	R1		R2A			T2		UC		
\	C		A	8	4	2				R2A	R5		T2		UC		
⧻ Segment Mark			A	8	4	2	1			R2A			T2	C	UC		
ƀ Substitute			A					R1	R2	R2A			T2	C	UC		*
⧻ Blank =				8		2	1					T1	T2	C		LC	
@ ,	C			8	4			R1		R2A	R5	T1	T2		UC		
:				8	4		1	R1		R2A		T1	T2	C	UC		
>				8	4	2				R2A	R5	T1	T2	C	UC		
⌐ (Tape Mark)	C			8	4	2	1			R2A		T1	T2		UC		
⸮	C	B	A	8		2					R5					LC	
A		B	A				1	R1	R2	R2A	R5			C		LC	
B		B	A			2			R2	R2A				C		LC	
C	C	B	A			2	1		R2	R2A	R5					LC	
D		B	A		4			R1		R2A				C		LC	
E	C	B	A		4		1	R1		R2A	R5					LC	
F	C	B	A		4	2				R2A						LC	
G		B	A		4	2	1			R2A	R5			C		LC	
H		B	A	8				R1			R5			C		LC	
I	C	B	A	8			1	R1								LC	
!		B		8		2					R5	T1		C		LC	
J	C	B					1	R1	R2	R2A	R5	T1				LC	
K	C	B				2			R2	R2A		T1				LC	
L		B				2	1		R2	R2A	R5	T1		C		LC	
M	C	B			4			R1		R2A		T1				LC	
N		B			4		1	R1		R2A	R5	T1		C		LC	
O		B			4	2				R2A		T1		C		LC	
P	C	B			4	2	1			R2A	R5	T1				LC	

* From keyboard R5 selected instead of R1, R2, R2A.

1415 Console Printer (continued)

Character		C	B	A	8	4	2	1	R1	R2	R2A	R5	T1	T2	C	
Character				**BCD Code**							**Magnets Picked**					
Q		C	B		8				R1			R5	T1			LC
R			B		8			1	R1				T1		C	LC
‡	(Record Mark)			A	8		2					R5		T2	C	LC
S		C		A			2	1		R2	R2A	R5		T2	C	LC
T				A			2	1		R2	R2A	R5		T2	C	LC
U		C		A		4			R1		R2A			T2		LC
V				A		4		1	R1		R2A	R5		T2	C	LC
W				A		4	2				R2A			T2	C	LC
X		C		A		4	2	1			R2A	R5		T2		LC
Y		C		A	8				R1			R5		T2		LC
Z				A	8			1	R1					T2	C	LC
0		C			8		2					R5	T1	T2		LC
1								1	R1	R2	R2A	R5	T1	T2	C	LC
2							2			R2	R2A		T1	T2	C	LC
3		C					2	1		R2	R2A	R5	T1	T2		LC
4						4			R1		R2A		T1	T2	C	LC
5		C				4		1	R1		R2A	R5	T1	T2		LC
6		C				4	2				R2A		T1	T2		LC
7						4	2	1			R2A	R5	T1	T2	C	LC
8					8				R1			R5	T1	T2	C	LC
9		C			8			1	R1				T1	T2		LC
v	(Word Mark)														C	UC
_	(Underscore)												T1	T2	C	UC

R WTØ1B
R
R
R COLLATING SEQUENCE   A
R
R   .. ¤¤ [[<< ‡‡ ℰℰ $$ ⁝⁝]] ;; ∆∆ -- // ,, %% ⌐⌐ \\ ⁕⁕ ƀƀ #‡ @@ :: >> √√ ?? /ØØ85
R   .. ¤¤ [[<< ‡‡ ℰℰ $$ ⁝⁝]] ;; ∆∆ -- // ,, %% ⌐⌐ \\ ⁕⁕ ƀƀ #‡ @@ :: >> √√ ?? /ØØ85
R
R AA BB CC DD EE FF GG HH II !! JJ KK LL MM NN OO PP QQ RR ‡‡ SS TT UU VV WW XX YY ZZ
R AA BB CC DD EE FF GG HH II !! JJ KK LL MM NN OO PP QQ RR ‡‡ SS TT UU VV WW XX YY ZZ
R
R ØØ 11 22 33 44 55 66 77 88 99 35 /ØØ4Ø/ØØ45/ØØ5Ø/ØØ55/ØØ6Ø/ØØ65/ØØ7Ø/ØØ75/ØØ8Ø/ØØ85
R ØØ 11 22 33 44 55 66 77 88 99 35 /ØØ4Ø/ØØ45/ØØ5Ø/ØØ55/ØØ6Ø/ØØ65/ØØ7Ø/ØØ75/ØØ8Ø/ØØ85
R
R ROCK   B
R
R #,$.IRZ96WOFDMU42SKB?!‡Ø8YQHGPX75VNECLT31/JA√⁕∆‡[]⌐:ƀƀ-ℰ<;\>@%⁝¤#,$.IRZ96WOFDMU42SK
R #,$.IRZ96WOFDMU42SKB?!‡Ø8YQHGPX75VNECLT31/JA√⁕∆‡[]⌐:ƀƀ-ℰ<;\>@%⁝¤#,$.IRZ96WOFDMU42SK
R
R ROLL   C
R
R #9642Ø87531√:ƀ>⁝%\ƀ⌐⁕/TVXY‡SUWZ,$ROMK!QPNLJ∆]-;⁝¤<ℰ[‡ACEGH?BDFI.$,#9642Ø87531√:ƀ>@%
R #9642Ø87531√:ƀ>⁝%\ƀ⌐⁕/TVXY‡SUWZ,$ROMK!QPNLJ∆]-;⁝¤<ℰ[‡ACEGH?BDFI.$,#9642Ø87531√:ƀ>@%
R
R TWIST   D
R
R @E%N⁝VH5<7;X\P>⁝ƀ?ƀ!-‡ℰØ[4]U⌐M:D√F⁕O∆W‡6⁂.H5<7ℰØ[4‡6F√D:?ƀG>Eℰℰ%N⁝VH5<7\XA.A.A.A.A.
R @E%N⁝VH5<7;X\P>⁝ƀ?ƀ!-‡ℰØ[4]U⌐M:D√F⁕O∆W‡6⁂.H5<7ℰØ[4‡6F√D:?ƀG>Eℰℰ%N⁝VH5<7\XA.A.A.A.A.
R
R WM ALIGNMENT AND WM PERIOD TESTS   E
R ĪIĪIⅯⅯⅯI!Ī!Y̆Y̆Y̆Ʇ:Ī:ⅯⅯⅯⅯ‡‡‡X̆xX̆x∆∆∆∆∀∀∀ⱴ⁝.⁝⌄∀∀∀∀∆∆∆∆X̆xX̆x‡‡‡W̆WⅯⅯ:Ī:ĪY̆Y̆Y̆!Ī!ĪⅯⅯⅯⅯIĪIĪ
R ĪIĪIⅯⅯⅯI!Ī!Y̆Y̆Y̆Ʇ:Ī:ⅯⅯⅯⅯ‡‡‡X̆xX̆x∆∆∆∆∀∀∀ⱴ⁝.⁝⌄∀∀∀∀∆∆∆∆X̆xX̆x‡‡‡W̆WⅯⅯ:Ī:ĪY̆Y̆Y̆!Ī!ĪⅯⅯⅯⅯIĪIĪ
R
R ∀∀∀∀∆∆∆∆⁝ⅯⅯⅯⅯ!IĪI⁝∀∀∀∀∆∆∆∆⁝ⅯⅯⅯⅯ!IĪI⁝.............ĪIĪIⅯⅯⅯⅯ⁝∆∆∆∆∀∀∀∀⁝ĪIĪIⅯⅯⅯⅯ⁝∆∆∆∆∀∀∀∀
R ∀∀∀∀∆∆∆∆⁝ⅯⅯⅯⅯ!IĪI⁝∀∀∀∀∆∆∆∆⁝ⅯⅯⅯⅯ!IĪI⁝.............ĪIĪIⅯⅯⅯⅯ⁝∆∆∆∆∀∀∀∀⁝ĪIĪIⅯⅯⅯⅯ⁝∆∆∆∆∀∀∀∀
R
R BANDWIDTH & ALIGNMENT TEST   F
R
R JJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$J
R JJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$JJJJJJJJJJLNQ!$J
R   *** END OF JOB ***
R
R

I/O PRINTER TEST

PGLIN	LABEL	OPCCD	OPERAND		CT	ADDRS
1002	LOADER	EQU	400			
1003						
1004	*		*****	STANDARD TADS *****		
1005		ORG	1000			01000
1006	*			1		
1007	TAD0	DC	@ @	NOT 1	1	01000
1008	TAD1		@ @	DO NOT BYPASS TYPE OUTS	1	01001
1009	TAD2		@ @	DO NOT LOOP ON ROUTINE	1	01002
1010	TAD3		@ @	DO NOT HALT ON ERRORS	1	01003
1011				DO NOT REPEAT PROGRAM		
1012				*TEST SET UP IN THE NOT 1 CONDITION*		
1013				AND WILL ONLY CHECK FOR A 1		
1014						
1015	*		*****	SPECIAL TADS *****		
1016						
1017	TAD4	DC	@ @	DO NOT TYPEOUT TIME TO TYPE 1 LINE	1	01004
1018				USE ONLY IF SYSTEM HAS OVERLAP		
1019	TAD5		@ @	DO NOT SELECT TEST PATTERN BY LETTER	1	01005
1020						
1021				* THE FOLLOWING MAY BE USED IN		
1022				TAD5 TO SELECT TEST PATTERNS		
1023				A TEST A COLLATING SEQUENCE		
1024				B TEST B ROCKING EXERCISE		
1025				C TEST C ROLLING EXERCISE		
1026				D TEST D TWISTING EXERCISE		
1027				E TEST E WORDMARK ALIGNMENT		
1028				F TEST F BANDWIDTH-ALIGNMENT		
1029				X TEST X SELECTED CHARACTERS		
1030				Z THEEND EOJ MESSAGE & B 400		
1031	GMWM	DCW	@MG@		1	01006

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	WTO1 INSTRUCTION
1033	*						
1034			*PROGRAM ALTER AND CONTROL ROUTINE				
1035	CONTRL	SBR	CTLXIT&5	STORE RETURN ADDR	7	01007	G 01081 B
1036	ENTER	RCP	ADDRES&4	ENTER LOCATION TO BE ALTERED	10	01014	M %TO 01049 R
1037		BNT1	CTLXIT	INQ NOT FROM CONSOLE	7	01024	R 01076 B
1038		BEX1	ENTER,M	TRY AGAIN IF 1/2/4/8	7	01031	R 01014 MG
1039		BAI	ADDRES		7	01038	R 01045 M
1040	ADDRES	RCPW	00000	ENTER DATA INTO ADDRES SPECIFIED	10	01045	L %TO 00000 R
1041		BEX1	ADDRES,S		7	01055	R 01045 S
1042		BAI	*&1		7	01062	R 01069 G
1043							
1044		B	TSTSEL	CHECK ON ENTRY TO SELECT A TEST	7	01069	J 01083
1045							
1046	CTLXIT	B	00000	RETURN TO PROGRAM	7	01076	J 00000
1047	*						
1048	*			*****			
1049	*						
1050	TSTSEL	BCE	TESTA,TAD5,A	COLLATING SEQUENCE	12	01083	B 02007 01005 A
1051		BCE	TESTB,TAD5,B	ROCK PATTERN	12	01095	B 02160 01005 B
1052		BCE	TESTC,TAD5,C	ROLL PATTERN	12	01107	B 02251 01005 C
1053		BCE	TESTD,TAD5,D	TWIST PATTERN	12	01119	B 02342 01005 D
1054		BCE	TESTE,TAD5,E	WM ALIGNMENT & WM PERIOD TESTS	12	01131	B 02433 01005 E
1055		BCE	TESTF,TAD5,F	BANDWIDTH AND ALIGNMENT ROUTINE	12	01143	B 02555 01005 F
1056		BCE	TESTX,TAD5,X	SELECTED CHARACTER ROUTINE	12	01155	B 02653 01005 X
1057		BCE	THEEND,TAD5,Z	EOJ MESSAGE & B 400 - NEXT TEST	12	01167	B 02993 01005 Z
1058		B	CTLXIT	RETURN TO ALTER ROUTINE	7	01179	J 01076
1059		H		DEFINE PRECEDING BRANCH LENGTH	1	01186	.

I/O PRINTER TEST

PGLIN	LABEL	OPCCD	OPERAND		CT	ADDRS	INSTRUCTION
1061		ORG	1230	CONTROL INFORMATION		01230	
1062		DC	@		15	01244	
1063		DC	@5510D@	SEQ# 551 5K SYS1 ONLY	5	01249	
1064	TESTID	DCW	@MTO1@	*TEST IDENTIFICATION	4	01253	
1065	LEVEL	DC	@B@,G		1	01254	
1066							
1067		ORG	1256	*SYSTEM CONTROL CARD		01256	
1068	SYS1	DC	@ @	INDICATE SYSTEM TYPE	1	01256	
1069				0 1410 STD			
1070				1 1410 ACC			
1071				X 7010			
1072			@ @	NOT INTERROGATED	6	01262	
1073			@ @	1-SYSTEM HAS OVERLAP	1	01263	
1074			@	@ NOT INTERROGATED	15	01278	
1075			@ *@		10	01288	
1076		ORG	1289			01289	
1077							
1078	*			UTILITY TYPING AND SPACING ROUTINE			
1079							
1080	TYPEIT	SBR	TYPE&8	STORE ADDRESS OF MESSAGE	7	01289	G 01304 B
1081	TYPE	WCP	00000	TYPE MESSAGE	10	01296	M %TO 00000 W
1082		SBR	TYPEXT&5	STORE ADDRESS FOR RETURN	7	01306	G 01383 B
1083		BCB1	TYPE		7	01313	R 01296 G
1084		BA1	*&1	CONTINUE	7	01320	R 01327 M
1085		CW	SPACEX&1		6	01327	⌐ 01358
1086	SPACE	SBR	SPACEX&6	EXIT WHEN SPACING	7	01333	G 01363 B
1087		WCP	ABLANK	ONE BLANK LOCATION	1C	01340	M %TO 01385 W
1088		BA1	*-16		7	01350	R 01340 M
1089	SPACEX	NCPWM			1	01357	N
1090		B	C0C00	EXIT WHEN SPACING	7	01358	J 00000
1091		SW	SPACEX&1		6	01365	. 01358
1092		BNQ	CONTRL	TO CONTROL ROUTINE	7	01371	J 01007 Q
1093	TYPEXT	B	00000	EXIT WHEN TYPING SUBTITLES, ETC	7	01378	J 00000
1094							
1095	ABLANK	DCW	@ @,G	JUST FOR A SPACE	1	01385	

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1097	*		INITIALIZATION- DONE ON FIRST PASS ONLY				
1098							
1099	SETUP	CS	99	CLEAR OUT TOP 100 ADDRESSES	6	01387	/ 00099
1100		MRCWG	B2000,1	SET UP RESET RESTART BRANCH AT 1	12	01393	D 01612 00001 L
1101		SW	95,25	SET WMS IN INDEX REGISTERS	11	01405	. 00095 00025
1102		MLWB	95,90	MOVE THEM ALL THE WAY THROUGH	12	01416	D 00095 00090 M
1103		ZA	OTIME,TIME	U SEC/PASS IN TIMING LOOP,1410	11	01428	DQ 01703 03587 Q
1104		BCE	CK4OLP,SYS1,0	SYSTEM IS STD 1410	12	01439	B 01485 01256 O
1105		ZA	ITIME,TIME	U SEC/PASS 1410 ACC	11	01451	M 01707 03587
1106		BCE	CK4OLP,SYS1,1	SYSTEM IS 1410 ACC	12	01462	B 01485 01256 I
1107		ZA	XTIME,TIME	U SEC/PASS 7010	11	01474	M 01711 03587
1108	CK4OLP	BCE	*&19,SYS1&7,	CHECK FOR OVERLAP	12	01485	B 01515 01263
1109		SW	OVRLAP&1	SET UP FOR OVERLAP	6	01497	. 03209
1110		MLCS	@@,TYPETP&1	TYPE IN OVERLAP MODE	12	01503	D 04436 03199 3
1111		SW	PATRNX&84	SET ADDRESS	6	01515	. 04436
1112		SAR	ENDOFX	IN INDEX REGISTER	7	01521	G 00049 A
1113		SW	TWTGP&40	SETTING WORDMARK IN PATTERN	6	01528	. 04056
1114		SW	SPBSP1,SPBSP1&82	SET WMS IN TEST PATTERN	11	01534	. 04100 04182
1115		SW	SPBSP2,SPBSP2&82		11	01545	. 04184 04266
1116		MLWB	SPBSP1&82,SPBSP1&80	MOVE WMS OVER EVERY OTHER ONE	12	01556	D 04182 04180 M
1117		MLWB	SPBSP2&82,SPBSP2&81		12	01568	D 04266 04265 M
1118		MLCS	@$&,ENTERX&9	SET UP READ CONSOLE PRINTER	12	01580	D 04437 02797 3
1119		B	TYPEIT		7	01592	J 01289
1120		DCW	@WTO1B@,G		5	01603	
1121		B	TESTA	BEGIN TEST PATTERN SEQUENCE	7	01605	J 02007
1122							
1123	B2000	DCW	@JC2000 @,G	RESET RESTART	7	01612	
1124		ORG	*&X00			01700	
1125	OTIME	DCW	&0167	U SEC/PASS IN TIMING LOOP 1410	4	01703	
1126	ITIME	DCW	&0133	U SEC/PASS IN TIMING LOOP 1410I	4	01707	
1127	XTIME	DCW	&0047	U SEC/PASS IN TIMING LOOP 7010	4	01711	

I/O PRINTER TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	WTO1 INSTRUCTION
1129		ORG	2000	PROGRAM STARTS HERE		02000	
1130	START	B	SETUP	INITIALIZATION-DONE 1ST PASS ONLY	7	02000	J 01387
1131							
1132							
1133	TESTA	B	SPACE	SPACING ROUTINE	7	02007	J 01333
1134		B	TYPEIT	COMMON UTILITY TYPING ROUTINE	7	02014	J 01289
1135		DCW	@COLLATING SEQUENCE	A@.G	40	02060	
1136							
1137	TYPEA	B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02062	J 03100
1138		DCW	CSGP1	COLLATING SEQUENCE GROUP 1	5	02073	03596
1139		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02074	J 03100
1140		DCW	CSGP1		5	02085	03596
1141							
1142		B	SPACE		7	02086	J 01333
1143		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02093	J 03100
1144		DCW	CSGP2	COLLATING SEQUENCE GROUP 2	5	02104	03680
1145		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02105	J 03100
1146		DCW	CSGP2		5	02116	03680
1147							
1148		B	SPACE		7	02117	J 01333
1149		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02124	J 03100
1150		DCW	CSGP3	COLLATING SEQUENCE GROUP 3	5	02135	03764
1151		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02136	J 03100
1152		DCW	CSGP3		5	02147	03764
1153							
1154		BCE	TYPEA,TA01,1	REPEAT PATTERN A	12	02148	B 02062 01001 1

I/O PRINTER TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	WTO1 INSTRUCTION
1156	TESTB	B	SPACE	SPACING ROUTINE	7	02160	J 01333
1157		B	TYPEIT	COMMON UTILITY TYPING ROUTINE	7	02167	J 01289
1158		DCW	@RCCK	Ba.G	40	02213	
1159							
1160	TYPEB	B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02215	J 03115
1161		DCW	ROKGP	ROCK GRCUP	5	02226	03848
1162		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02227	J 03115
1163		DCW	ROKGP		5	02238	03848
1164							
1165		BCE	TYPEB,TAD1,1	REPEAT PATTERN B	12	02239	B 02215 01001 1
1166	*						
1167	*						
1168	*			*****			
1169	TESTC	B	SPACE		7	02251	J 01333
1170		B	TYPEIT		7	02258	J 01289
1171		DCW	@ROLL	Ca.G	40	02304	
1172							
1173	TYPEC	B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02306	J 03115
1174		DCW	ROLGP	ROLL GROUP	5	02317	03932
1175		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02318	J 03115
1176		DCW	ROLGP		5	02329	03932
1177							
1178		BCE	TYPEC,TAD1,1	REPEAT PATTERN C	12	02330	B 02306 01001 1
1179	*						
1180	*						
1181	*			*****			
1182	TESTD	B	SPACE		7	02342	J 01333
1183		B	TYPEIT		7	02349	J 01289
1184		DCW	@TWIST	Da.G	40	02395	
1185							
1186	TYPED	B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02397	J 03115
1187		DCW	TWTGP	TWIST GROUP	5	02408	04016
1188		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02409	J 03115
1189		DCW	TWTGP		5	02420	04016
1190							
1191		BCE	TYPED,TAD1,1	REPEAT PATTERN D	12	02421	B 02397 01001 1

I/O PRINTER TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	WTOI INSTRUCTION
1193	TESTE	B	SPACE	SPACING ROUTINE	7	02433	J 01333
1194		B	TYPEIT	COMMON UTILITY TYPING ROUTINE	7	02440	J 01289
1195		DCW	@WM ALIGNMENT AND WM PERIOD TESTS E@,G		40	02486	
1196							
1197	TYPEE	B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02488	J 03115
1198		DCW	SPBSP1	SPACE AND BACKSPACE GROUP 1	5	02499	04100
1199		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02500	J 03115
1200		DCW	SPBSP1	SPACE AND BACKSPACE GROUP 1	5	02511	04100
1201							
1202		B	SPACE		7	02512	J 01333
1203		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02519	J 03115
1204		DCW	SPBSP2	SPACE AND BACKSPACE GROUP 2	5	02530	04184
1205		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02531	J 03115
1206		DCW	SPBSP2	SPACE AND BACKSPACE GROUP 2	5	02542	04184
1207							
1208		BCE	TYPEE,TAD1,1	REPEAT PATTERN E	12	02543	B 02488 01001 1
1209	.						
1210	.			*****			
1211	.						
1212	TESTF	B	SPACE		7	02555	J 01333
1213		B	TYPEIT		7	02562	J 01289
1214		DCW	@BANDWIDTH & ALIGNMENT TEST F@,G		40	02608	
1215							
1216	TYPEF	B	WCP	BANDWIDTH AND ALIGNMENT GROUP	7	02610	J 03100
1217		DCW	BWAGP		5	02621	04268
1218		B	WCP	BANDWIDTH AND ALIGNMENT GROUP	7	02622	J 03100
1219		DCW	BWAGP		5	02633	04268
1220							
1221		BCE	TYPEF,TAD1,1	REPEAT PATTERN F	12	02634	B 02610 01001 1
1222							
1223							
1224		B	THEEND	TEST X DONE ON REQUEST ONLY	7	02646	J 02993

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	WT01	INSTRUCTION
1226	TESTX	B	SPACE		7	02653	J	01333
1227		B	TYPEIT		7	02660	J	01289
1228		DCW	@SELECTED CHARACTER ROUTINE	X@,G	40	02706		
1229								
1230		S	BUMP1	ZERO INDEX REGS USED TO COUNT	6	02708	S	00069
1231		B	TYPEIT		7	02714	J	01289
1232		DCW	@ENTER MODE- M OR L@.G		18	02738		
1233		RCPW	MODE,S	ENTER MODE - M OR L	10	02740	L %IO 03419 R
1234		BEX1	*-16,M	TRY AGAIN ON 1/2/4/8/A	7	02750	R 02740 S M
1235		BAI	*&1		7	02757	R 02764 G M
1236		B	TYPEIT		7	02764	J 01289
1237		DCW	@ENTER DATA FIELD@.G		16	02786		
1238	ENTERX	RCPW	PATRNX	ENTER CHARACTERS FOR PATTERN	1C	02788	L %IO 04352 R
1239				ENTER GMWM FOR SHORT LINE				
1240		SBR	NEXT1,S	STORE ADDR OF LAST CHAR ENTERED&1	7	02798	G 00059 B S
1241		BEX1	*-23,M	TRY AGAIN ON 1/2/4/8/A	7	02805	R 02788 M
1242		BAI	*&1		7	02812	R 02819 G M
1243		C	NEXT1,&PATRNX	SEE IF ANY ENTRY WAS MADE	11	02819	C 00059 04442
1244		BE	TYPEX	NO TYPE OLD PATTERN	7	02830	J 02914 S
1245		S	&1,NEXT1	REDUCE B ADDR REG BY 1	11	02837	S 04443 00059
1246	CK4END	C	NEXT1,ENDOFX	CHECK FOR END OF PATTERN	11	02848	C 00059 00049
1247		BE	TYPEX	CK TYPE IT	7	02859	J 02914 S
1248	EXPAND	MLCWS	PATRNX&BUMP1,0&NEXT1	EXPAND TO FULL LINE	12	02866	D 04LV2 00*MO 7 Q
1249		SBR	NEXT1	STORE ADDR OF LAST CHAR ENTERED&1	7	02878	G 00059 B
1250		A	&1,BUMP1	ADD TO COUNTERS	11	02885	A 04443 00069
1251		A	&2,NEXT1	STEP TO NEXT LOCATION	11	02896	A 04444 00059
1252		B	CK4END	SEE IF ITS ALL DONE	7	02907	J 02848

I/O PRINTER TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1254	TYPEX	BCE	LMCDE,MODE,L	TYPE IN LOAD MODE	12	02914	B 02957 03419 L
1255		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02926	J 03100
1256		DCW	PATRNX	SELECTED CHARACTER AREA	5	02937	04352
1257		B	WCP	TYPE TEST PATTERN IN MOVE MODE	7	02938	J 031C0
1258		DCW	PATRNX	SELECTED CHARACTER AREA	5	02949	04352
1259		B	*&25		7	02950	J 02981
1260							
1261	LMODE	B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02957	J 03115
1262		DCW	PATRNX	SELECTED CHARACTER AREA	5	02968	04352
1263		B	WCPW	TYPE TEST PATTERN IN LOAD MODE	7	02969	J 03115
1264		DCW	PATRNX	SELECTED CHARACTER AREA	5	02980	04352
1265							
1266		BCE	TYPEX,TAD1,1	REPEAT ROUTINE	12	02981	B 02914 01001 1
1267	.			*****			
1268	.						
1269	.						
1270	THEEND	B	TYPEIT	*** END OF JOB ***@.G	7	02993	J 01289
1271		DCW	@		48	03047	
1272		BNQ	CONTRL	ANY LAST REQUEST	7.	03049	J 01007 Q
1273		BCE	TESTA,TAD3,1	REPEAT TEST-NO INITIALIZATION	12	03056	B 02007 01003 1
1274		B	LOADER	ON TO NEXT PROGRAM	7	03068	J 00400
1275		H		DEFINE PRECEDING BRANCH LENGTH	1	03075	.
1276	.			*****			
1277		ORG	*&X00			03100	

I/O PRINTER TEST

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1279							
1280	*		TEST PATTERN TYPING ROUTINE				
1281	WCP	SBR	DATA	STORE ADDRESS OF DATA PATTERN	7	03100	G 00039 B
1282		B	SETOP	SET UP TYPE INSTRUCTION MODE	7	03107	J 03130
1283		DCW	@M@	MOVE MODE	1	03114	
1284							
1285	WCPW	SBR	DATA	STORE ADDRESS OF TEST PATTERN	7	03115	G 00039 B
1286		B	SETOP	SET MODE OF TYPE INSTRUCTION	7	03122	J 03130
1287		DCW	@L@		1	03129	
1288							
1289	SETOP	SBR	*&6	STORE M OR L OP CODE	7	03130	G 03142 B
1290		MLCWS	0,TYPETP	SET MODE IN TYPE INSTRUCTION	12	03137	D 00000 03198 ? Q
1291		CW	6&DATA	SET ADDRESS	6	03149	@ 000M6
1292		SAR	RETURN	FOR RETURN TO TEST ROUTINE	7	03155	G 00029 A
1293		S	TOTAL	ZERO TIMING COUNTER	6	03162	S 03595
1294		CS	BUFFER&82	CLEAR OUT OUTPUT AREA	6	03168	/ 03582
1295		MLNA	4&DATA,*&6	SET ADDRESS OF TEST PATTERN	12	03174	D 000M4 03191 / Q
1296		MRCWG	0,BUFFER	SET TEST PATTERN INTO OUTPUT AREA	12	03186	D 00000 03500 L
1297	TYPETP	WCPW	BUFFER	TYPE TEST PATTERN	10	03198	L %TO 03500 W
1298	OVRLAP	NOPWM			1	03208	N
1299		BOL1	TIMER		7	03209	J 03230 1
1300		BCB1	TYPETP		7	03216	R 03198 2
1301		B	CK4ERR		7	03223	J 03248
1302	TIMER	A	TIME,TOTAL	ADD LOOP TIME TO TOTAL	11	03230	A 03587 03595
1303		BOL1	*-17	RETURN WHILE OVERLAP IN PROCESS	7	03241	J 03230 1
1304	CK4ERR	BA1	ERRORT	BRANCH TO ERROR ROUTINE	7	03248	R 03328 M G
1305		BCE	EDITIT,TAD4,1	EDIT TIME FOR TYPEOUT	12	03255	B 03274 01004 1
1306		B	CK4INQ	NO TIME TYPEOUT	7	03267	J 03314
1307	EDITIT	MLCWA	CTLFLD,RESULT&4	PREPARE RESULT FIELD	12	03274	D 03425 03430 X
1308		MCE	TOTAL-4,RESULT&4	EDIT TOTAL FOR TYPING	11	03286	E 03591 03430
1309		WCP	RESULT	TOTAL TIME FOR ONE LINE	10	03297	M %TO 03426 W G M
1310		BA1	*-16		7	03307	R 03297 M
1311	CK4INQ	BNQ	CONTRL	TO CONTROL ROUTINE	7	03314	J 01007 Q
1312		B	0&RETURN	RETURN TO TEST ROUTINE	7	03321	J 000+0

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1314	*			ERROR ROUTINE			
1315							
1316	ERRORT	BCE	CK4HLT,TAD0,1	BYPASS ERROR TYPEOUT	12	03328	B 03392 01000 .1
1317		B	TYPEIT		7	03340	J 01289
1318		DCW	@*** DATA CHECK IN LAST LINE TYPED ***@,G		37	03383	
1319		BNQ	CONTRL		7	03385	J 01007 Q
1320	CK4HLT	BCE	HALT,TAD2,1	HALT ON ERROR	12	03392	B 03411 01002 1
1321		B	*@2		7	03404	J 03412
1322	HALT	H			1	03411	.
1323		B	CK4INQ	RETURN TO TEST PATTERN TYPING	7	03412	J 03314
1324							
1325	*			CONSTANTS, OUTPUT AREA			
1326							
1327	MODE	DCW	@ @,G	MODE-M OR L	1	03419	
1328	CTLFLD		@ . 0@	EDIT CONTROL FIELD	5	03425	
1329	RESULT		@ . SECS@,G	TIME TO TYPE 1 LINE OF TEST GROUP	10	03426	
1330							
1331		ORG	*6X00	UP TO NEXT HIGHER CENTURY ADDRESS		03500	
1332	BUFFER	DA	1X83,G	TYPE AREA		03500	
1333	TIME	DCW	60C00	MICROSECONDS PER PASS IN ADD LOOP	4	03587	
1334	TOTAL		@000000000@	TOTAL TIME	8	03595	

PGLIN	LABEL	OPCOD	OPERAND		CT	ADDRS	INSTRUCTION
1336	*		TEST PATTERNS				
1337							
1338	CSGP1	DC	@ BB·°SS·ºoLL LL GG RR ·· DD WW		50	03596	
1339			@ SS MM BB ## aa ·· TT MM QQ ·· LL -- // ·· &% SSa		33	03678	
1340	CSGP2		@AA BB CC DD EE FF GG HH II ·· JJ KK LL MM NN OO PPa		50	03680	
1341			@ CQ RR ## SS TT UU VV WW XX YY ZZa.G		33	03762	
1342	CSGP3		@00 11 22 33 44 55 66 77 88 99 35 /0040/0045/0050/0a		50	03764	
1343			@055/0060/0C65/0070/0075/0080/0085a.G		33	03846	
1344	ROKGP		@#.$.IRZ96WOFDMU42SKBM.#08YQHGPX75VNECLT31/JAMMLMBBa		50	03848	
1345			@S: B-£T;STa%=D#.$.IRZ96WCFDMU42SKa.G		33	03930	
1346	ROLGP		@#9642087531M. Ta%SBSM/TVXY#SUWZ,$RCMK.QPNLJLB-;·ºTa		50	03932	
1347			@£BMACEGHMBDFI-$.#9642087531M. Ta%a.G		33	04014	
1348	TWTGP		@@E%N=Vo5T7,$ XSPTG MB.-#£O84BUSM.DMFMOLWM6#.o5T7£O84a		50	04016	
1349			@M6FMD.M GTE@E%N=Vo5T7SXA.A.A.A.a;G		33	04098	
1350	SPBSP1		@IIIMMMM.??? :·:·WWW+##+XXXXLLLLVVV·.·VVVVLLLa		50	04100	
1351			@LXXXX+##+WWWW·:·:YYYY·???·MMMMIIIa.G		33	04182	
1352	SPBSP2		@VVVVLLLL.MMMM.????·VVVVLLLL.MMMM.????·:·:·:·:·:a		50	04184	
1353			@··MMMM.LLLLVVVV·:··MMMM.LLLLVVVVa.G		33	04266	
1354	BWAGP		@JJLNQ.$JJJJJJJJJLNQ.$JJJJJJJJJLNC.$JJJJJJJJJLNQa		50	04268	
1355			@.$JJJJJJJJJLNQ.$JJJJJJJJJLNQ.$JJJJJJJJJLNQ.$Ja.G		33	04350	
1356	PATRNX		@ a		50	04352	
1357			@ a.G		33	04434	
1358							
1359	RETURN	EQU	1,X	ADDR OF RETURN TO TEST ROUTINE			
1360	DATA	EQU	3,X	ADDR OF DATA FIELD TO BE TYPED			
1361	ENDOFX	EQU	5,X	ADDR OF END OF TEST X PATTERN			
1362	NEXT1	EQU	7,X	ADDR REG USED IN TEST X EXPANSION			
1363	BUMP1	EQU	9,X	COUNT TO EXPAND PATTERN IN TEST X			
1364							
1365		END	START				J02000
1365			@a@		1	04436	
1365			a$a		1	04437	
1365			PATRNX		5	04442	04352
1365			£1		1	04443	
1365			£2		1	04444	

END OF ASSEMBLY